FOREST PEST MANAGEMENT
ASHEVILLE FIELD OFFICE

Forest Insect & Disease Management

Report No. 79-1-45
December 1979

RESISTANCE SCREENING CENTER

NO EFFECT FROM CONSTANT OPERATION OF HUMIDIFIER IN INCUBATION CHAMBER

Developmental Test 205-78

S. D. Hubbard, Plant Pathologist

George Ryan, Statistician

ABSTRACT

After inoculation with the fusiform rust fungus, seedlings were incubated with the incubation chamber humidifier running constantly and with the humidifier on an on/off cycle. There was no difference in infection associated with the humidifier cycle.

INTRODUCTION

Pine seedlings are inoculated with the fusiform rust fungus at the Resistance Screening Center and placed in a large chamber where temperature and relative humidity are controlled. Humidity is controlled by a large humidifier on a timer. While inoculating pines, the door of the chamber must be left open. To compensate for vapor loss, the humidifier is left running constantly. Five minutes after an inoculation is complete and all seedlings are in the chamber, the humidifier is placed on the on/off cycle. Seedlings then remain in the chamber for 24 hours.

Occasionally, the humidifier has not been placed on the timer, but run constantly for the 24-hour incubation period. The purpose of this test is to determine the effect of this on infection.

SOUTHEASTERN AREA, STATE & PRIVATE FORESTRY
USDA FOREST SERVICE, ATLANTA, GA 30309

METHODS

Seedlings were inoculated in January 1978. Resistance Screening Center operational screening procedures, as of that date, were used with the following exceptions.

Four runs (replications) were done. The first three runs were on consecutive days; the fourth was 14 days after the first run.

In each run, one loblolly and two slash seedlots were inoculated at two different basidiospore densities. In each run, six trays of each seedlot were inoculated with 50,000 spores/ml. Six trays of each slash seedlot were inoculated with 20,000 spores/ml, and six trays of the loblolly family were inoculated with 35,000 spores/ml.

Northern red oaks were inoculated with aeciospores from each of 10 slash pine collection regions. Basidiospores produced from collections from each region were mixed and dilutions of each density made from this mixture. Pines were inoculated with the same spore suspensions in the first three runs. Pines were inoculated with a second spore suspension of each density in the fourth run.

For runs on days 1, 3 and 14, the humidifier was on an on/off cycle of 1 minute on and 1 minute off. On day 2, the humidifier was left on for the entire 24-hour incubation period.

Analyses of variance with and without seedlot included were used to compare runs with the humidifier on the on/off cycle with the run with the humidifier left on for the entire incubation period.

RESULTS

Run means ranged from 56 to 65 percent galled (table 1). The F-statistic of .87 with seedlot included and 1.06 with seedlot excluded are not significant at the .05 level. Therefore it is concluded that leaving the humidifier on had no influence on infection.

Table 1. Percent galled of three seedlots after inoculation at two densities and incubation with humidifier on on/off cycle and operating constantly

Day	Humidifier	20,000 Spores/ml. GA SL	20,000 Spores/ml. CRR	35,000 Spores/ml. 11-23	50,000 Spores/ml. 11-23	50,000 Spores/ml. GA SL	50,000 Spores/ml. CRR	mean
1	on/off cycle	49	45	55	79	92	67	65
2	operating constantly	66	43	46	58	93	61	61
3	on/off cycle	51	47	34	59	85	58	56
14	on/off cycle	66	44	52	53	84	65	60
	mean	58	45	47	62	89	63	61